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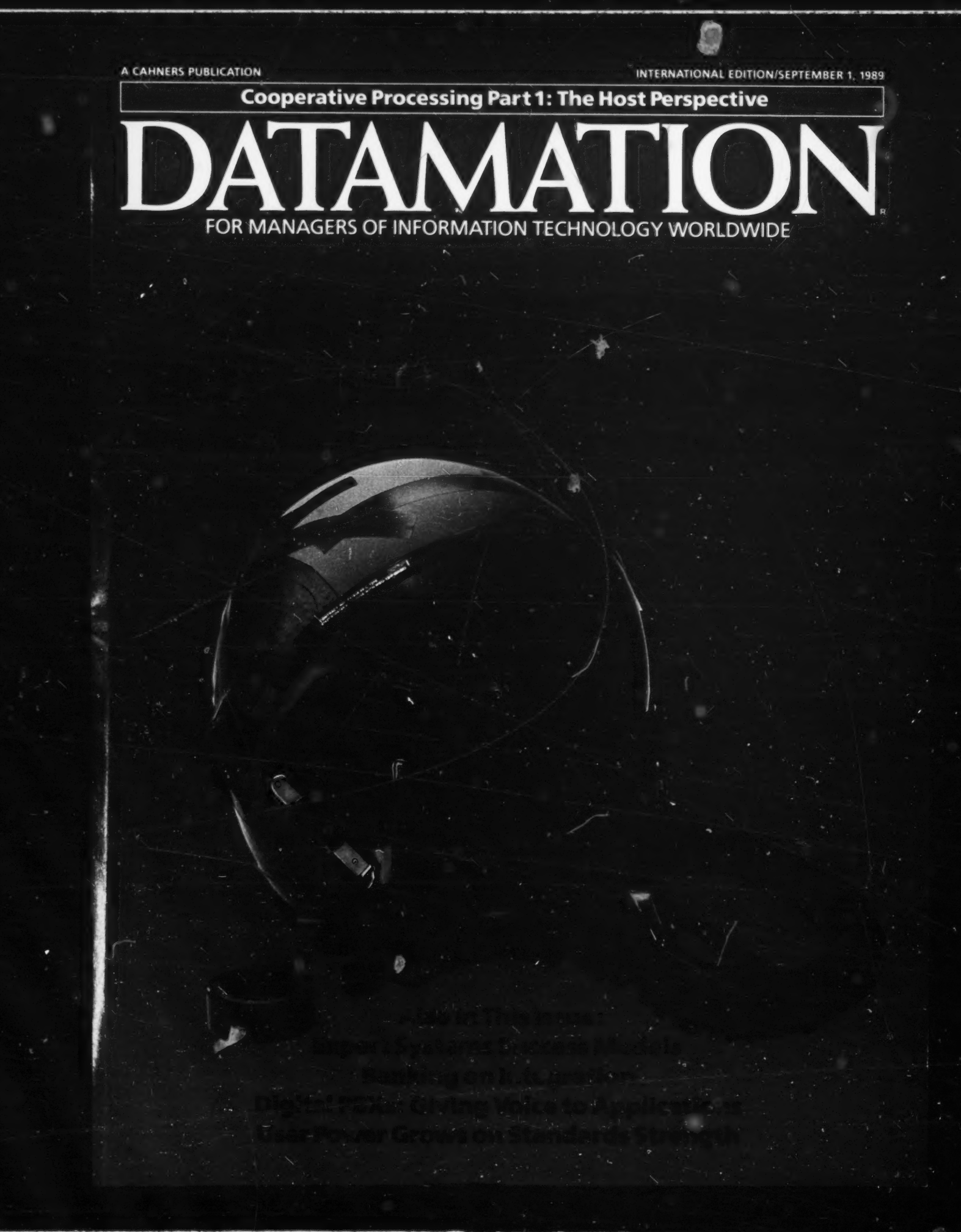
Cooperative Processing Part 1: The Host Perspective

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE



SEPT. 1, 1989

DATAMATION

FOR MANAGERS OF INFORMATION TECHNOLOGY WORLDWIDE

VOLUME 35
NUMBER 17

COVER STORY

The Pentagon's Botched Mission 22

BY WILLIE SCHATZ The U.S. Department of Defense has tried for years to modernize its military information system, but the job is still incomplete. Users are outraged at the unfinished system, responsibility for the project has been transferred, its name has been changed twice and no one is entirely sure what will happen now. What went wrong with a system that has already cost taxpayers almost $400 million?

Cover Photography by David Bradley

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Some Answers to Complex Problems

Complexity needs to be managed more carefully than any other aspect of a major systems undertaking. Yet sometimes it is overlooked by information systems managers and business executives—as well as their suppliers—in the haste to build and enhance information technology infrastructures that will support their organizations. The builders aren't guilty of neglect or ineptitude. They're just too concerned with technology choices, cost analyses, development schedules and other facets of significant IS projects to assess how to best manage the complex tasks before them.

Such oversight almost can be excused given what's already expected of today's IS decision makers. They're being asked to make hardware, software and communications investments and manage human resources in an era of unprecedented change in nearly every sphere they influence—macroeconomic (globalization), microeconomic (decentralization, mergers and acquisitions) and technology (distributed processing).

But such oversight can be devastatingly costly, as demonstrated in this issue's cover story, "The Pentagon's Botched Mission," p. 22. Washington bureau manager Willie Schatz's tale of woe about a $400 million information system critical to the defense of the United States—the so-called World Wide Military Command and Control System (WWMCCS) program—provides a valuable lesson for any IS team charged with developing a massive system. "[It's] a case study in nearly everything that could go wrong with an IS project," Schatz writes, "poor communications with users, improperly designed specifications, missed deadlines, budget cuts—to name the most prominent problems."

Photograph by David Bradley

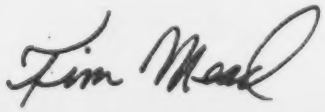
TUMULTUOUS HISTORY: WWMCCS' difficulties go back nearly 20 years.

Rather than continue to mismanage the complex project, Washington has shifted management for WWMCCS, reduced its scope, relied more on off-the-shelf software and delegated most of the technologically insignificant buying decisions to users.

Profiting From Experience

The private sector has had its share of failures in complex systems development, too. In "Expert Systems Success Models," p. 35, contributor Marc Meyer, a professor at Northeastern University in Boston, identifies two user organizations that have learned from others' mistakes in the field of artificial intelligence. The savvy AI students are Lincoln National Reinsurance Cos. and Stone & Webster Inc. In "Banking on Integration," p. 31, contributor Lawrence Stevens discovers how two leading U.S. banks, Exchange National Bank of Chicago and Banc One Services Corp., have turned the dismal results posted by other banks in large scale integrated systems development into profitable IS gains.

Computing models (aka architectures) and standards are perhaps the most visible signs of a world struggling to manage complexity. That's why there's so much interest these days in cooperative processing, the subject of a three-part series that begins in this issue with our San Jose bureau manager Susan Kerr's story, "The Host Perspective," p. 45. The different models for such processing rely on standards—whether promulgated by a dominant force like IBM, endorsed by formal standards bodies or, as is increasingly the case, demanded by users. New York bureau manager Parker Hodges addresses the latter in "User Power Grows," p. 61.



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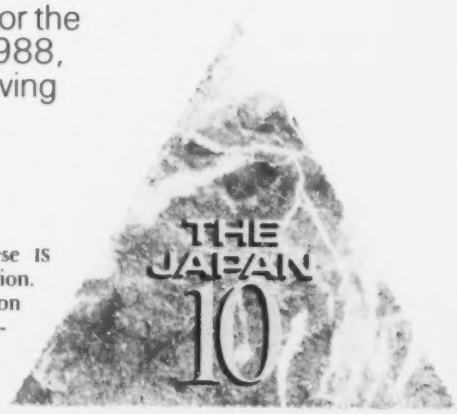
Japan's IS Market Momentum

Whether you figure it in dollars or in yen, growth for the top ten IS companies in Japan was stunning in 1988, evidence of the fact that Japan is the fastest growing major IS market in the world.

BY STUART M. DAMBROT



The combined IS revenues of the top 10 companies in Japan soared by a massive 29% last year in dollar terms to $44 billion. That was up from $34 billion in 1987.

Even taking into account the 11% rise in the value of the yen during the course of 1988, that still leaves a formidable 18% growth rate—making Japan by far the fastest growing major IS market in the industrialized world.

This continuing IS momentum in the island nation helped the Asia/Pacific region as a whole to increase its share of the world IS market from 22% in 1987 to 25% last year. That's compared with a drop of 3% in market share for North America, an area that now accounts for only 38% of world IS revenues and is likely to fall even further over the next few years.

The threshold for entry to the DATAMATION Japan top 10 ranking also rose significantly—up by 22% from Oki Electric Industry Co. Ltd.'s $921.2 million in 1987 to Ricoh Co. Ltd.'s $1.12 billion this year.

Once again, at the top of the IS heap in 1988 was Fujitsu Ltd., the supercomputer-to-PC company that saw local IS sales rise by a healthy 28% in dollars. Fujitsu's Japanese sales topped $9 billion last year, and the Japanese market now accounts for 83% of its total IS revenues.

Just behind Fujitsu is NEC Corp. which reported Japanese IS revenues up 17% to $8.9 billion. NEC is closing the gap fast on Fujitsu. In 1987, the two Japanese giants were separated by over $400 million, but last year NEC chopped that gap down to only $227 million.

IBM Japan Ltd. follows NEC at number three, up one place from last year because of more reliable 1987 figures and improved revenue performance stemming from strong sales of its AS/400 midrange computers. It seems that the U.S. company's new partnership policy in Japan, where the company has linked up with a variety of local hardware and software firms, is paying off.

Hitachi Ltd. has been pushed back to the number four slot in the 1988 survey, but, with less than $200 million separating it from IBM at number three, this is certainly ground it can recover if it has a strong year in 1989.

Hitachi was the only company to drop a place on the 1988 ranking, with four companies moving up one place—IBM to number three, Oki to number nine, Nippon Telegraph & Telephone Co. to number eight, and Nihon Unisys Ltd. up to number seven. Nihon Unisys (formerly Nippon Univac Kaisha Ltd.) recorded the top growth rate of the ten companies due to the merger of the Burroughs and Sperry operations in Japan. The company had revenues of over $2 billion in 1988, representing a massive 59% increase in dollar terms.

Off the list for 1988 was Mitsubishi Electric Corp., which ranked number seven in the 1987 table. This fall was due to two factors—more reliable breakdowns of the company's IS business and only modest growth in its IS revenues over the year. Mitsubishi's departure opened the way for fast-growing Ricoh to enter the list at number 10, up from number 11 in 1987. Ricoh's 37% boost in IS sales pushed its Japanese IS revenues over the $1 billion mark for the first time in 1988.

But while sales rose throughout the Japanese islands, the high yen, rising costs at home and growing fears of protectionism in foreign markets forced Japan's IS industry offshore in 1988.

Some Japanese firms even began to move their research and development activities offshore, especially to those Asian countries where they've already estab-

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JAPAN: Growth for the top 10 IS companies in Japan was stunning in 1988. 64-1

EUROPE: Through Istel '92, IS managers from 20 phone companies hope to create a one-stop telecom shop. 64-1

INNOVATIONS: Meiko offers new Sun-based workstations; Memorex brings out an intelligent workstation. 64-21

lished a manufacturing and sales presence: Hong Kong, Singapore, South Korea and Taiwan—the so-called "Four Dragons." At the same time, manufacturers are turning to Indonesia, Malaysia and Thailand for manufacturing because of cheap labor and other cost advantages.

Office Computers Unique to Japan

The main IS product developments in Japan in 1988 and early 1989 were the office computer, or OFCOM, a configuration unique to the Japanese market, and the release of supercomputers which, notes John Stern, vice president of Asian operations at the American Electronics Association's (AEA) Tokyo office, "have whittled down the American supercomputer competition down to Cray."

Lower down the power scale, the mainframe continues to be popular despite its slowdown in other markets. "To me," observes Dave Moschella, senior vice president at International Data Corp., a consulting firm based in Framingham, Mass., "the most striking thing about Japan's domestic market—especially when compared with the U.S.—is that it continues to be so mainframe-intensive. The installed base of mainframes in Japan equals that in the U.S., even though the total number of machines is half of that in the States. They're reportedly trying to change and use more PCs and minis, but the numbers don't show that yet. Smaller machines are being used in small businesses, but large corporations are still fairly centralized—even though PC technology from the U.S. should be driving them the other way."

The obstacles to widespread PC use seem to remain the same: the difficulty of handling the complex Japanese language on a keyboard (which few Japanese have used); the delays involved in processing Japanese characters on anything less than a 32-bit microprocessor (which, according to NEC, is incorporated in only 5% of the computers now used in Japan); the lack of standardization in Japan's computer industry; and historical differences in software development (spreadsheets, for example, have not really caught on).

Strategies for the 1990s

In the 1990s, the Japanese feel, the number of on-line global information systems with as many as 100,000 terminals will steadily increase. To meet the anticipated demands of these large-scale strategic systems, all Japanese mainframe manufacturers announced a wide spectrum of products in 1988, with special emphasis on a number of factors. These include: microcomputer/mainframe linkage (MML); the ability to handle large volumes of data with widely varying formats, including batch-processing for management coupled with distributed processing for business; hardware and operating system software capable of multimedia transmission, in preparation for full-scale implementation of the integrated services digital network (ISDN); and the ability to support multivendor systems and networks.

The Japanese mainframe computer market's product cycles are IBM-driven. In 1988, IBM began shipping its AS/400 midrange computers. Partly in anticipation and partly in response to this announcement, IBM's main competitors here—primarily Fujitsu, along with NEC, Hitachi, Toshiba and Nihon Unisys—started delivering comparable systems. These companies typically compete on a cost basis, giving large discounts to government and academia. This tactic effectively excludes U.S. firms from these markets, and generates an intense do-

Leading Japanese-Owned Computer Companies

Nippon Telegraph and Telephone entered the list in 1988, displacing Mitsubishi.

RANK	COMPANY	1988 TOTAL IS REV ($MIL)	% CHG ($U.S.)	%CHG (YEN)
1	Fujitsu	10,999.1	25.9	11.5
2	NEC	10,475.7	27.3	12.8
3	Hitachi	8,247.6	31.5	16.5
4	Toshiba	4,226.6	22.8	8.8
5	Matsushita	3,441.0	30.9	16.0
6	Canon	3,391.6	43.1	26.8
7	Nihon Unisys	2,057.7	58.9	40.8
8	Ricoh	1,727.5	35.4	20.0
9	Nippon Tel & Tel	1,694.0	50.1	33.0
10	Seiko Epson	1,487.7	24.1	10.0

Source: DATAMATION.

The DATAMATION Japan 10

The combined revenues of the top 10 IS companies in the Japanese market reached $44 billion in 1988.

1988 RANK	1987 RANK	COMPANY	OWNERSHIP	1988 JAPAN IS REV ($ MIL)	% CHG ($ US)	% CHG (YEN)	1988 WORLDWIDE IS REV ($ MIL)	% CHG ($US)	1988 WORLDWIDE REV ($ MIL)
1	1	Fujitsu	Japan	$9,162.3	27.8	13.3	$10,999.1	25.9	$16,905.5
2	2	NEC	Japan	8,935.3	32.4	17.3	10,475.7	27.3	22,895.1
3	4	IBM Japan	US/Japan	6,543.2	27.3	12.8	9,269.2	26.4	9,269.2
4	3	Hitachi	Japan	6,367.1	23.8	9.7	8,247.6	31.5	46,885.1
5	5	Toshiba	Japan	3,558.8	32.6	17.5	4,226.6	22.8	28,759.0
6	6	Matsushita	Japan	2,938.6	33.1	17.9	3,441.0	30.9	40,721.9
7	8	Nihon Unisys	Japan/US	2,057.7	58.9	40.8	2,057.7	58.9	3,057.7
8	9	Nippon Tel & Tel	Japan	1,694.0	50.1	33.0	1,694.0	50.1	42,920.3
9	10	Oki	Japan	1,192.4	29.4	14.7	1,472.1	29.4	4,311.8
10	11	Ricoh	Japan	1,116.0	36.7	21.1	1,727.5	35.4	5,370.1

Source: DATAMATION.

Fastest Growers in Japan

The merger of Burroughs and Sperry operations in Japan brought Nihon Unisys to the top of the growth chart in 1988.

JAPAN 10 RANK	COMPANY	% CHG (YEN)	JAPAN 1988 IS REV ($MIL)
7	Nihon Unisys	40.8	$2,057.7
8	Nippon Tel & Tel	33.0	1,694.0
10	Ricoh	21.1	1,116.0
6	Matsushita	17.9	2,938.6
5	Toshiba	17.5	3,558.8

Source: DATAMATION.

mestic price war. Recently, IBM was forced to adopt the same tactic, offering discounts of up to 70%. The move is creating a backlash, with Japanese firms halving prices in response.

To compete against IBM's 3090 mainframes, Fujitsu last year introduced the Amdahl 5990-1400 and 5990-700 machines in Japan—its first fully IBM software-compatible mainframes. In software, Hitachi announced Hitachi Application Architecture (HAA)—similar to IBM's Systems Application Architecture (SAA)—which will allow Hitachi systems of all sizes to use the same software. Hitachi also introduced its M-620, M-630 and M-640 compact, high-performance low-to-midrange general-purpose computers, offering these small-business computers also an alternative to IBM's AS/400.

The current debate over UNIX standardization has found its way to Japan, where on May 18 this year, the major players—the OSF (Open Software Foundation), UI (UNIX International Inc.) and Japan's IPA (Industrial Technology Promotion Agency) which backs the Japanese UNIX-based SIGMA software productivity project, joined the international standards group X/Open Co. Ltd.

Interoperability also emerged as a major trend in 1988. According to INTAP (Data Processing Interoperability Technology Association), there have been successful connectivity experiments of equipment with standardized file transfer and data management functions. Japanese manufacturers are planning to gradually commercialize and sell such equipment later this year, after INTAP completes successful trials using Open Systems Interconnection (OSI) protocols.

Currently, the engineering workstation (EWS) market is dominated by U.S. firms, and for the last four years the vast majority of EWSs in Japan have been stand-alone units. However, the market for network configurations has been rapidly expanding. Fujitsu, Hitachi, Mitsubishi Electric, Toshiba and other manufacturers are all participating.

The NeXT Coup

"Japan's chips and peripherals—especially laser printers and floppy disks—create opportunities for themselves," says IDC's Moschella. "But the U.S. is keeping them at bay." Perhaps the biggest U.S. coup was pulled off by Palo Alto, Calif.-based NeXT Inc. when it managed to get Canon Inc. to pay a whopping $100 million for a mere distributorship for the innovative NeXT workstation. Moschella says he is "amazed that Canon paid that amount of money without getting any technology rights. There must be something else going on—perhaps long-term joint development work."

Also creating opportunities are new developments in laptops. Starting to appear in Japan are thin, ultralight full-function laptops. The first is the NEC Ultralight, a 4.4-pound model for the U.S. market. Seiko Epson Corp. has announced one even smaller. Soon to arrive (some have already been displayed at trade shows) are laptops with color liquid crystal display (LCD) screens from Hitachi, NEC, Seiko Epson, Sharp Corp. and Toshiba. As might be expected, color costs a lot: the units are expected to sell for $10,000 abroad and ¥1 million in Japan.

Looking toward the future, the AEA's Stern also points to a renewed interest in TRON (The Realtime Operating System Nucleus), a private sector project initiated by Ken Sakamura in 1984 dedicated to developing open systems architecture. Although the TRON projects—MTRON (Macro), ITRON (Industrial), BTRON (Business) and CTRON (Central and Communication)—are in various stages of development Sakamura already envisions a ¥100 billion TRON-based Intelligent City, built by the year 2000.

Future Visions

But perhaps the most important long-range concern among the information service industry is Japan's growing internationalization particularly in terms of software and services imports. For example, 75% of the data bases used in Japan originate overseas. When the supercomputer wars fizzle out over the next few years, data bases may be the new trade battleground. In the meantime, Japan's domestic market looks set to continue its rapid growth during 1989, providing an even stronger base from which its domestic IS giants can expand into markets in Europe and the United States. But, although these high growth rates may last through this year, Japanese companies must prepare to hit a domestic ceiling sooner or later—possibly in the early to mid-1990s. That's when the world will find out which companies are the real IS samurai and which companies are just along for the ride. ▭

Stuart M. Dambrot is a freelance journalist in Tokyo.

JAPAN IS REV AS % OF TOT REV	IS REV AS % OF TOT REV	NET INCOME ($ MIL)	1988 TOTAL EMPLS	FISCAL YEAR END
83.3	65.1	456.5	94,825	Mar.
85.3	45.8	573.8	105,486	Mar.
70.6	100.0	665.1	21,061	Dec.
77.2	17.6	1,060.3	161,000	Mar.
84.2	14.7	600.5	129,000	Mar.
85.4	8.4	1,471.0	134,186	Mar.
100.0	100.0	27.5	7,616	Mar.
100.0	3.9	1,322.3	279,983	Mar.
81.0	34.1	106.4	18,659	Mar.
64.6	32.2	121.2	33,000	Mar.

Where the Smart IS Investors Are Putting Their Money

Customers of information systems are determined to connect systems before shopping for new CPUs.

BY MADELINE FRANCHI

Large U.S. users of information systems are focusing on connecting their existing computer systems rather than buying new ones. That much is evident in the latest purchasing data from the U.S. government, which show communications investments climbing at a much higher rate than computer outlays. In the first quarter of this year, U.S. businesses spent at an annualized $46.9 billion rate for communications equipment. In that same quarter, businesses were spending at an $39.1 billion annualized clip for computers and office equipment. Compared with a year ago, communications purchases picked up 10%, but computer investments edged up a mere 1.2%.

Spurring communications purchases is the battle waging among long-distance carriers and local telephone companies for a share of the voice and data transmission revenues generated by both corporate and residential customers.

In contrast, the spending pace for computers and office equipment has indeed slowed—although it is still above last year's levels. In the second quarter of 1988, business expenditures for computer systems had swelled to an annualized $41.0 billion—18.2% above the spending rate exhibited in the second quarter of 1987. Since mid-1988, though, the growth rate has shrunk to 1.2%.

The causes of this reticence to buy new computers are twofold: doubt and technology. Buyers are uncertain about the economy—in the United States and elsewhere. Fluctuating interest rates and world currencies, rampant mergers and acquisitions, and unstable political conditions continue to undermine the best economic forecasting models.

Buyers of computer and office equipment also are in the dark about the existence of technical standards—be it operating systems, bus architectures or communications protocols. Data suggest buyers will continue to hold off on purchases of major new systems until they see some real standards emerge.

Technology itself continues to advance rapidly enough to lower the price of computer performance—albeit at a slower rate than in years past. That means customers can increase their computer investments marginally and still realize significant increases in raw computing power.

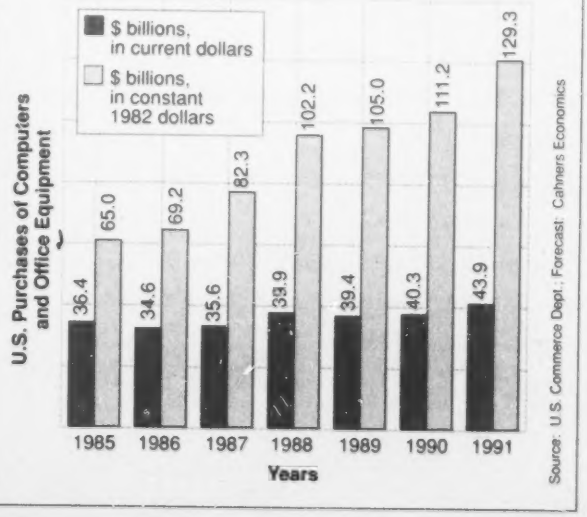
Such expectations, combined with the doubts about technology and the uncertain business climate, will lead to a 1% decline (in current dollars) for U.S. business purchases of computers and office equipment by the end of this year, Cahners Economics forecasts. But, this contraction will be mild and short compared with the 1985 – 1986 industry recession. And, business spending for computers is expected to turn around in 1990 and grow strongly through 1991.

At the same time, U.S. communications investments are expected to remain relatively strong throughout the economic slowdown of the next year or so. Purchases of networks, multiplexers, central-office switches and the like may increase as much as 8% this year. The pace will slow to 5% in 1990 but quicken again in 1991.

More economic information can be obtained from Cahners Economics Department, 275 Washington St., Newton, MA 02158, (617)-964-3030.

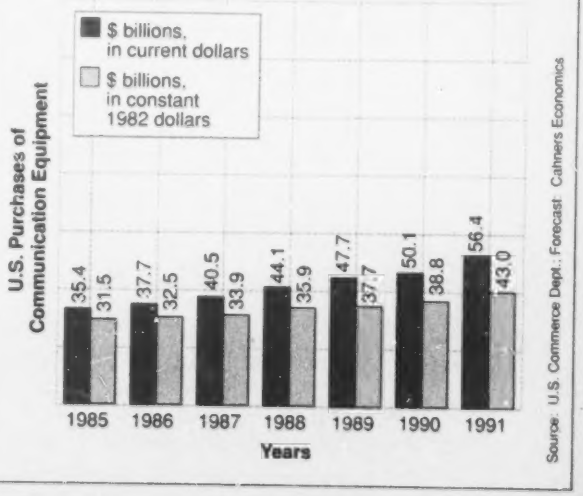
Holding the Line on Computers...

U.S. business investments in systems will be nearly flat this year.



While Letting Loose on Communications

Corporations are not letting uncertain economies stop them from buying communications equipment.



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